# Microstructure and mechanical behavior of friction stir welded/processed structural aluminum and titanium alloys

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## ABSTRACT

Friction stir welding (FSW) has evolved extremely rapidly into a viable and affordable technology to join metallic alloys to manufacture structures for use in transportation systems. Automotive, aircraft, space and ship building industries have been actively pursuing this technology for the last eight years to 10 years to join aluminum alloys, steels and recently titanium alloys. Research work is progressing at a vigorous pace on all fronts, including novel tool design, optimization of process parameters to produce mechanical properties equal to or better than fastened structures, and process models to understand and guide the FSW process. This paper focuses primarily on high strength aluminum alloys, aluminum-lithium alloys and titanium alloys that have applications in aircraft and space.